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four times as large. *M. subfalcata* of Borneo, is about the same size as *M. dareaecarpa*, but has a once divided vein. *M. paradoxa*, widely distributed in Polynesia and eastern Asiatic regions, is the largest of the group, sometimes as much as six inches long, and has one or two divisions of its primary vein. The fifth species, *M. trichoidea*, is, as its name means, actually thread-like in structure and size, but longer than *M. dareaecarpa*, and with one to three fertile portions along its length. It is rather common in collections of Philippine ferns.

The accompanying illustration (Plate 3) shows a plant of *M. dareaecarpa*, life size (fig. 1) an enlarged leaf showing the single vein (fig. 2) and a still more enlarged section of the leaf showing the groove in which the sporangia are born (fig. 3). These figures are redrawn from the *Bulletin of the Torrey Botanical Club*, Vol. 38, Plate 3. With them are also illustrated a leaf of *Asplenium Trichomanes*, life size (fig. 4), and a pinna enlarged to show the venation (fig. 5), both drawn from an herbarium specimen, and a plant, life size (fig. 6), and an enlarged leaf of *Trichomanes Petersii* (fig. 7), redrawn from Plate 3 in Vol. 7 of the JOURNAL.

BROOKLYN, N. Y.

Texas Pteridophyta—II

ERNEST J. PALMER

BOTRYCHIUM OBLIQUUM Muhl. Marshall, Harrison County, 8644; San Augustine, San Augustine County, 7102 and 12706.

Found in low, wet woods at Marshall. A form, 8644a, growing with the other specimens, may be variably distinct. A much reduced form, growing on rotten logs and hummocks in deep Tupelo and Cypress swamps at San Augustine, appears to represent a distinct and perhaps undescribed variety.

BOTRYCHIUM VIRGINIANUM L. Livingston, Polk County, 5270; Marshall, Harrison County, 5301 and 13227; Lacey's Ranch, Kerr County, 9981; Palestine, Anderson County, 13425; San Augustine, San Augustine County, 13240.

Usually found in open woods or on rich, shaded hill-sides. The specimens from Kerr County are far out of its usual range, but it is there associated with a number of other eastern herbs and trees of the Atlantic forest belt, which seem to have survived from an earlier period, in the deep protected canyons. The plants were growing in rich alluvial soil, near a spring branch and in partial shade.

SCHIZAEACEAE

ORNITHOPTERIS MEXICANA (Kl.) Underw. Concan, Uvalde County, 10189; Leahey, Real County, 10139; Barksdale, Edwards County, 11001; Fischers Store, Comal County, 12180; Montell, Uvalde County; Medina Lake, Bandera County; Utopia, Uvalde County; Devils River, Valverde County.

This species is usually found on dry, partially shaded, steep hillsides, on banks of dry ravines or under overhanging limestone ledges, in dry soil. It belongs to a flora that has come up from northern Mexico, and occupied the southern side of the Edwards Plateau.

OSMUNDACEAE

OSMUNDA REGALIS L. Milano, Milam County, 11683; Grapeland, Houston County, 12072; Marshall, Harrison County, 13216; Fletcher, Hardin County; Palestine, Anderson County; San Augustine, San Augustine County; Oakwood, Leon County.

Grows in wet, sandy woods, margins of sandy bogs, and on hummocks in deep swamps.

OSMUNDA CINNAMOMEA L. Milano, Milam County, 11684; Grapeland, Houston County, 12058; Palestine,

Anderson County; Fletcher, Hardin County; Marshall, Harrison County; Oakwood, Leon County.

Usually found with the last, but sometimes in rather drier situations.

POLYPODIACEAE

POLYPODIUM POLYPODIOIDES (L.) Watt. Columbia, Brazoria County, 4988; Livingston, Polk County, 5257; Houston, Harris County, 11446; Larissa, Cherokee County, 13365; Riverside, Walker County, 13171; Fletcher, Hardin County; San Augustine, San Augustine County; Huntsville, Walker County; Liberty, Liberty County; Oakwood, Leon County; Grapeland, Houston County.

Throughout its range in Texas this fern is usually found growing on trees, and apparently it has little preference as to species, providing they grow in moderately shaded and damp situations and have a rough, porous bark and wide-spreading or horizontal branches or inclined trunks, where the spores can find lodgment while germinating and a supply of moisture for some time after rains. Near the Gulf Coast the Live Oak (*Quercus virginiana*) serves its requirements most admirably, and it is often found upon species of *Tilia*. Occasionally it is found growing on rocks, where the spores have found lodgment amongst moss or lichens. The specimens from Larissa were found on ferruginous sandstone boulders, and those from Riverside on sandstone bluffs.

PTERIS AQUILINA L. var. *PSEUDOCAUDATA* Clute. Livingston, Polk County, 5187; Milano, Milam County, 11690; Houston, Harris County, 11942; Marshall, Harrison County, 13217; Palestine, Anderson County; Oakwood, Leon County; Grapeland, Houston County; Huntsville, Walker County; Jacksonville, Cherokee County.

Very common in open, sandy woods and acid soils generally, throughout eastern Texas, where it sometimes covers acres of ground.

ADIANTUM CAPILLUS-VENERIS L. Boerne, Kendall County, 9269; Lacey's Ranch, Kerr County, 9980; Kerrville, Kerr County; Telegraph, Kimble County, 10941; Pulliam, Zavalla County, 11331; Devils River, Valverde County, 11381; Houston, Harris County, 11949; San Marcos, Hays County, 12103; Gamble's Ranch, Armstrong County, 13914; Utopia, Uvalde County; Blanco, Blanco County; San Saba, San Saba County; Manchaca, Travis County; Fischers Store, Comal County; Medina Lake, Bandera County; Barksdale, Edwards County; Paloduro Canyon, Randall County; Rock Springs, Edwards County.

This widely distributed southern fern, although occurring in the Ozark region of Arkansas and Missouri, appears to be absent from a large area in eastern Texas, the isolated station near Houston being very exceptional. In the canyons of the Edwards Plateau it grows in great luxuriance and abundance on the rocky margins of pools and limestone bluffs and ledges, kept perennially wet by seeping springs. The Houston station, discovered by Mr. Geo. L. Fischer, is along a deep, shaded spring branch, where there is an outcrop of somewhat calcareous Quaternary sandstone. In Randall and Armstrong Counties it is found, rarely, in deep spring-fed canyons, growing upon shale and sandstone of Triassic age.

PELLAEA ATROPURPUREA (L.) Link. San Augustine, San Augustine County, 7896; Spanish Pass, Kendall County, 9868; Kerrville, Kerr County, 9932; Lacey's Ranch, Kerr County; Leahey, Real County, 10158; Edwards County, 10967; Brownwood, Brown County, 11115; Blanco, Blanco County, 11572; Menard, Menard

County, 11789, 11887; Gamble's Ranch, Armstrong County, 13913; Stephenville, Erath County, 14179; Barksdale, Edwards County.

Grows amongst rocks and on rocky ledges of partially shaded ravines and hillsides. One of the most widely distributed ferns in the state.

PELLAEA WRIGHTIANA Hook. Llano, Llano County, 10284.

Growing here in clefts of sandstone, on dry hillsides.

PELLAEA ASPERA (Hook.) Baker. Lacey's Ranch, Kerr County, 10026; Laredo, Webb County, 11319; Menard, Menard County, 11886; Blanco, Blanco County, 12869, 13287; San Saba, San Saba County, 11799; Colorado, Mitchell County, 13778; Austin, Travis County, 13666; Kerrville, Kerr County; Sabinal, Uvalde County; Fischers Store, Comal County; Medina Lake, Bandera County; Barksdale, Edwards County.

In rocky clefts or under protecting ledges. Usually in limestone formations, but at Laredo and Colorado found in sandstone clefts.

PELLAEA PULCHELLA (Mart. & Gal.) Fée. Leakey, Real County, 10144; Concan, Uvalde County, 11554; Montell, Uvalde County, 12991; Chalk Bluff, Uvalde County; Barksdale, Edwards County.

Found on high limestone hills, on rather exposed ledges.

PELLAEA FLEXUOSA (Kaulf.) Link. Austin, Travis County, 9341; Lacey's Ranch, Kerr County, 10024; Leakey, Real County, 10140; Uvalde, Uvalde County, 11052; San Saba, San Saba County, 11790; San Marcos, Hays County, 12108; Sabina Creek, Kendall County, 13640; Manchaca, Travis County; Barksdale, Edwards County.

Grows in rather dry situations amongst limestone rubble or under ledges. At Uvalde it was collected amongst trap-rock (phonolite) rubble.

CHEILANTHES ALABAMENSIS (Buckl.) Kunze. Boerne, Kendall County, 9268, 9836; Sabina Creek, Kendall County, 13640; Telegraph, Kimble County, 10953, 10964; Brownwood, Brown County, 11413; Concan, Uvalde County, 11555; Quarry, Washington County, 11707; San Saba, San Saba County, 11788; San Marcos, Hays County, 12107; Manchaca, Travis County, 12139; Blanco, Blanco County, 12868; Utopia, Uvalde County, 12948; Montell, Uvalde County, 12990, 13005; Riverside, Walker County, 13161; Medina Lake, Bandera County; Barksdale, Edwards County.

Usually found on limestone hillsides, in clefts and under protecting ledges. The specimens from Quarry and Riverside were growing in clefts of coarse, Tertiary (Corrigan) sandstone. Its occurrence on this formation seems to be an eastward extension of its range in Texas.

CHEILANTHES MICROPHYLLA Sw. Leakey, Real County, 10157; Comstock, Valverde County, 11065; Montell, Uvalde County, 13013; Chalk Bluff, Uvalde County, 13336; Devils River, Valverde County.

In similar situations to last, but less common and more restricted in range, apparently occurring only in the southwestern part of the state.

CHEILANTHES LEUCOPODA Link. Montell, Uvalde County, 12325, 13336; Chalk Bluff, Uvalde County.

Found only on high limestone hills, on exposed slopes and ledges.

CHEILANTHES FEEI Moore. Leakey, Real County, 10141; San Angelo, Tom Green County, 11140, 11144; Bronte, Coke County, 11169; Menard, Menard County, 11857; Gamble's Ranch, Armstrong County, 13930;

Colorado, Mitchell County, 13777; Strawn, Palopinto County, 14239; Big Spring, Howard County; Sweetwater, Nolan County.

At San Angelo, Bronte, Colorado and Gamble's Ranch this species was found on sandstone bluffs, although at the last named station it was more abundant on Cretaceous limestone rocks. All other occurrences noted were on dry limestone bluffs, which is its usual habitat.

WEBB CITY, MO.

(To be continued)

The Botrychiums of Mobile County, Alabama

E. W. GRAVES

Mobile county lies principally in the coast plain. However, there is a line of sand hills extending down through the northwest corner of the county, running about half way across and coming within seven miles of the city of Mobile. The east side is very low and marshy. Along the Alabama river and Mobile bay, which bound the east side of the county, is a continuation of swamps which also cover a large part of the south end of the county.

The flora of this low country is very rich, for here we find *Sarracenia flava*, *S. rubra*, *S. psittacina*, *S. drummondii*, the yellow, red, and purple pitcher-plants. Also we find *Pogonia ophioglossoides*, *P. divaricata*, *Limodorum tuberosum*, *L. parviflorum*, *L. pallidum*, and *L. multiflorum*, and a large representation of *Habenaria* and others of the orchid family. Here too are found eight species of the *Rhexia* or Meadow Beauty family.

Among the ferns there are found the Woodwardias, *Osmundas*, *Dryopteris patens*, and other of the marsh loving kinds.

It is on the higher ground of the north and west part of the county that we find the subjects of this sketch.